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# Factors Influencing Participation in Screening Mammography Among Rural Women

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# SCREENING MAMMOGRAM AMONG RURAL WOMEN

## Factors Influencing Participation in Screening Mammography Among Rural Women

Presented in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Nursing Practice

By

Kelly Colliver, MSN

The Graduate School

Otterbein University

2016

SCREENING MAMMOGRAM AMONG RURAL WOMEN

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2016

## ACKNOWLEDGEMENTS

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### **Abstract**

Rural residents at all income levels are significantly less likely than urban residents to participate in cancer screenings. Furthermore, rural women face common significant barriers to mammography, including: knowledge deficit, lack of primary care provider, no health insurance, fear, decreased access, transportation issues and financial constraints. The purpose of this project is to investigate factors influencing participation in screening mammography among rural women in Adams and Highland counties. Both of these Southern Ohio counties have lower than average rates of screening mammography.

For this project, a non-experimental, cross-sectional design was utilized. Data was collected using a survey, based on the revised Champions Health Belief Model Scale. One hundred women voluntarily signed consent and participated in the survey, ninety of the women met the inclusion criteria. Quantitative data analysis was performed, as well as qualitative inquiry on the open-ended questions. A two proportions test found with statistical significance that women who have a primary care provider are more likely to participate in screening mammography than women without a primary care provider. It was also found that the majority of rural women surveyed, unless there is a positive family history of breast cancer, do not view themselves as susceptible to breast cancer. The qualitative data provided valuable insight regarding the attitude of rural women towards participation in screening mammography. “Time constraints” was the most common reason given for not having a mammogram in the past 12 months. A “reminder card” is what the participants believed made it easy for them to get a mammogram regularly. Consistent with the literature, the findings reiterate the importance of the role of the primary care provider in health promotion among rural women.

## **Factors Influencing Participation in Screening Mammography Among Rural Women**

### **Introduction**

Breast cancer is the most commonly diagnosed cancer in women, accounting for 29 % of all female cancers. Although numerous local, state, and national screening programs are in place, screening mammography rates remain less than ideal in certain populations. Approximately one-third of women eligible for screening in rural areas report not getting a mammogram in the past two years, compared to 25 % of women nationwide. Rural women who are at low income and educational levels remain at an increased risk for not receiving screening mammograms (Purtzer & Overstreet, 2014). Thus, low participation rates in health promotion behaviors, specifically breast cancer screening, presents a legitimate health concern for rural women.

Low rates of screening mammography is of significance to nurses, as well as all health care providers, as it is associated with higher morbidity and mortality (Kratzke, Wilson, & Vilchis, 2013). Advanced practice registered nurses (APRNs) can make changes that potentially improve outcomes for women, by advocating for health promotion through participation in screening mammography. Kratzke et al., (2013) state that “provider recommendation is a strong predictor for screening mammography adherence in urban and rural women” (p.54). While the evidence is strong that provider recommendation does make a difference in screening behaviors, it continues to be inconsistent and often incomplete. According to Arroyave, Penaranda, and Lewis (2011), the screening rates remain low due to the failure in the provision of cancer screening services in clinical practice. Given the magnitude of the disease of breast cancer, health care providers should feel compelled to change the primary care culture and discuss individualized screening mammography needs at every visit.

Assessment of this clinical situation illustrates the necessity for change. One of these barriers that is amenable to change is the health care provider recommendation for screening mammography, which will be addressed within this project. This descriptive project took place during a relatively short time frame, over several months, although the potential benefits last into the future. A desired short-term outcome would be to increase breast cancer screening rates

of all eligible women, including high-risk populations. A desired intermediate outcome would include early diagnosis and treatment of breast cancer. Lastly, a desired long-term outcome would include a decrease in morbidity and mortality from breast cancer among rural women.

According to Ohio's cancer registry, only 68.3% of breast cancers were diagnosed at an early stage in 2010 (Ohio Chronic Disease Workgroup, 2014). In rural Highland County, Ohio the incidence of breast cancer is 97/100,000, which is consistent with national rates. The percentage of women reporting "no mammogram in the past 12 months" is 40%, which is higher than the national rate of 36% (Susan G. Komen, 2011). Given the high rates of women that are unscreened, there is potential for an increased number of late stage cancer diagnoses. These statistics clearly indicate a need for increased education and screening among rural women.

### **Background and Significance of the Problem**

Breast cancer is the second leading cause of cancer death among women in the United States (Davis et al., 2012; Kratzke et al., 2012). It is the most commonly diagnosed malignancy in women, accounting for one third of all female cancers. The lifetime risk of developing breast cancer for women is now 1 in 8. Morbidity and mortality rates from breast cancer can be reduced by detecting disease in its pre-symptomatic state, through screening mammography (Edgar, Glackin, Hughes, & Rogers, 2013). According to Vyas et al. (2013), mammography screening is considered to be effective at detecting breast cancer early and reducing mortality among women who are at average risk. Arroyave et al. (2011) confirm that breast cancer screening has been proven effective at reducing morbidity and mortality. Lastly, Njor et al. (2012) identified a breast cancer mortality reduction of 26% after following women ages 50-69 in a screening program for five years. Thus, the evidence is clear that screening mammography does save lives. It is imperative that health care providers realize the importance of breast cancer screening and the evidence that supports its recommendation.

In 1990, the Centers for Disease Control and Prevention (CDC) created the National Breast and Cervical Cancer Early Detection Program (NBCCEDP). The program was initiated to increase access to cancer screenings for low income women and has been shown to save lives. However, the CDC estimates that the program is only reaching 12% of women eligible to receive



screening mammograms (American Cancer Society, 2013). The national program is operated by the individual states, territories, and other national partners. In Ohio, the Breast and Cervical Cancer Project (BCCP) began in 1994. Since its inception through 2011, it has served over 73,000 women in the eleven different regional sites across Ohio. During this time, over 109,000 mammograms have been performed, the majority of them on women over the age of 50 (Ohio Department of Health, 2014).

Despite national programs aimed at improving breast cancer screening access and affordability, disparities continue amongst certain populations of women. Disadvantaged women including those with low income, no health insurance, low education levels, and those belonging to racial/ethnic minorities have low rates of mammography (Davis et al., 2012). In addition, women who are unmarried, lack a primary health care provider and/or live in a rural area are also at high risk for non-screening behaviors (Purtzer, 2012). Davis et al. (2012) states that rural residents, at all income levels, are significantly less likely than urban residents to have any cancer screenings, even after adjusting for insurance coverage and demographics. Lower rates of screening can lead to poor health outcomes for rural women. Purtzer and Overstreet (2014) report that rural women who are at low income and educational levels are at an increased risk for underusing mammography, “which places them at higher risk for detection of late-stage breast cancer” (p.176). Additionally, breast cancer mortality rates have been found to be higher in women living in rural areas compared with women in urban areas (Leung, McKenzie, Martin, Dobson, & McLaughlin, 2014). Hence, the impact of the low rates of screening mammography is well documented and of concern.

Rural women often face different barriers to health care than their urban counterparts. Common significant barriers to mammography for rural women include: knowledge deficit, lack of a primary health care provider (PCP), no health insurance, fear, decreased accessibility, transportation issues and financial constraints (Giordano et al., 2011). Knowledge of these common barriers will enable health care providers in rural regions to better assist women to participate in screening behaviors. These barriers will be discussed in further detail.

Knowledge deficit regarding breast cancer and recommended screening is often cited in

the literature as a common barrier among rural women. Davis et al. (2012) reported that although rural women had a high awareness of breast cancer, only one in three women had ever been given information on mammograms, and were unsure when to begin screening. This gap in knowledge often relates to the lack of regular visits to a health care provider, a problem that is commonly experienced in rural areas. Absence of medical insurance, high cost and the lack of a primary care provider are some of the reasons rural women do not visit a health care provider regularly (Nuno et al., 2012). Purtzer (2012) confirms that knowledge deficit and the woman's lack of awareness of a need for a mammogram is what prevents these women from participating in screening behaviors. It is more likely that if these women were seeing a health care provider routinely, they would gain the knowledge and reinforcement needed to proceed with screening mammography in a timely fashion. The shortage of primary care providers in rural areas is crucial, since a provider recommendation is a strong predictor for mammography screening (Kratzke et al., 2013). Research by Nuno et al. (2012) confirmed that low rates of health insurance and limited availability of health care providers in rural areas decreases access to breast screening services. Kratzke et al. (2013) reports that rural women obtain health information from traditional sources, such as health care professionals, family and friends. These findings reinforce the importance of the health care provider's role in providing guidance related to breast cancer screening. Davis et al. (2012) identified the need for clinics to give women patient centered information about the benefits of screening mammography. Thus, there are several known facilitators to screening that health care providers can implement to help improve compliance with screening mammography.

Even if knowledge of screening recommendation is present, other obstacles can prevent women from participating in screening behaviors. Lustria et al. (2010) reported that the bottom line often relates to transportation and travel time. Lack of a vehicle, inability to drive, unable to afford gas/or to pay a driver, long distance to a screening facility, and lack of public transportation are just a few of the hindrances that rural women face when trying to obtain their mammogram. Due to the long distances in many rural areas, this is one barrier that is often difficult to overcome. Longer travel time has been associated with missed mammograms and

later stage diagnosis of breast cancer (Onitilo et al., 2014). For several decades, the utilization of mobile mammography units has been instrumental in providing screenings for at risk women in rural areas. Studies have shown that mobile units are effective at increasing screening participation rates, reducing barriers for hard to reach populations, and that educational interventions accompanying mobile unit visits can increase compliance among women (Fontenoy et al., 2013). In addition to mobile units, scheduling mammograms at a convenient time and location and using a reminder system are essential elements to increase compliance (Davis et al., 2012).

Another obstacle for some women may include emotional influences. Psychological factors such as anxiety and worry have been associated with both the promotion and avoidance of screening mammography (Edgar et al., 2013). Many women cite fear as influencing their willingness to get a screening mammogram. They fear the procedure itself, mainly based on reports of pain and discomfort from other women (Lustria et al., 2010). Davis et al. (2012) identified that the fear of finding something wrong, as well as believing a mammogram is uncomfortable, as significant barriers among rural women, when compared with urban women. Conversely, fear and emotions can also be responsible for moving a woman to get a screening mammogram. According to Purtzer (2012), a significant health related event (ie: cancer diagnosis in friend or family) will often serve as a facilitator for the woman to get a screening mammogram. Due to the new situation, the woman realizes her personal risk for acquiring breast cancer and begins to participate in activities to protect her health (Purtzer, 2012). The APRN should not overlook the chance to assess for any anxieties or fears, and to help the woman deal with them effectively and move positively toward screening behaviors.

Financial limitations, often manifested by lack of insurance or high deductible plans, is another common barrier to mammography for rural women. A study in severely economically deprived Appalachian regions of Kentucky, Ohio, and Pennsylvania concluded that lower breast cancer screening rates were associated with later stage breast cancer diagnosis (Anderson et al., 2014). Un-insured and under-insured women have the most difficulty with screening (Lustria et al., 2010). Nuno et al., (2012) concludes that low rates of health insurance in rural areas

contribute to decreased access and utilization of breast cancer screening services. According to the Ohio Department of Health (2016), approximately 1.5 million Ohioans remain uninsured. Nuno et al., (2012) also noted that public insurance has been shown equal to private insurance in promoting mammogram usage in certain rural ethnic groups. Unfortunately, some women who have recently gained health insurance after the Affordable Care Act are still unsure what services are covered without cost. According to the U.S. Department of Health and Human Services (2016) screening mammograms every one to two years, starting at age 40 must be covered with no cost sharing, effective August of 2012. Health care providers are positioned to remind women that mammogram screening, as well as other important screenings are covered with no out of pocket cost, no matter what type of insurance plan they are enrolled in.

To reduce disparities in screening, strategies to improve breast cancer screening will be most effective when focused on the needs of women that are at high risk for not being tested (Nuno et al., 2012). The American Cancer Society (2013), goes further to recommend that efforts to increase screenings should target socioeconomically disadvantaged women, as they are most likely to have lower screening mammography rates. Hence, the current literature gives health care providers some useful information when planning for future interventions to encourage health promotion in the form of breast cancer screening.

As supporters of health promotion and healthy lifestyles, advanced practice registered nurses (APRNs) can utilize the evidence from the literature to encourage healthy lifestyle choices for the people they serve. In addition, APRNs often care for the underserved populations. Thus, the challenge of health promotion in disadvantaged populations is a situation commonly faced by APRNs. One shared area of concern is the early detection of breast cancer, through the use of screening mammography. As priorities shift “from cancer treatment to prevention and early detection”, health care providers need to realize barriers as well as motivators to screening behaviors (Edgar et al., 2013, p. 1021). In addition, an understanding of the complex financial structure for health care screenings will enable the health care provider to assist the woman to navigate the system.

In summary, current evidence provides confirmation that breast cancer screening rates

remain low among rural women, especially when also socioeconomically disadvantaged. There are national programs, implemented at the local level, designed to increase accessibility and affordability to mammograms. Although, for reasons not clear in the literature, the programs are only reaching a small percentage of women that are qualified to participate in the services. The goal of this project is to identify factors influencing mammography screening behaviors among women in two rural counties in Southern Ohio. The valuable insight gained will assist the health care providers in the area in targeting at risk women, helping them move toward screening behaviors, improving health outcomes and possibly even saving lives.

### **Problem Statement**

Breast cancer is the most commonly diagnosed cancer in women, and early detection can save lives. Research shows that rural women have lower rates of screening mammography, thus increasing risk for late stage cancer diagnosis.

### **Project Implementation and Measures**

The Health Belief Model (HBM) serves as the theoretical model for this project investigating participation in screening mammography among rural women in two counties in Southern Ohio. The original HBM hypothesized that health-related actions depends upon the concurrent happening of three factors: 1) the existence of sufficient motivation to make health issues relevant, 2) the belief that one is susceptible to a serious health problem and 3) the belief that following a health recommendation would be beneficial in reducing the perceived threat (Rosenstock, Strecher, & Becker, 1988). For decades, the HBM has frequently been used as a framework to explain differences in mammography screening behaviors. The HBM includes factors that are believed to influence a certain health related behavior and the likelihood of behavior change: perceived susceptibility to developing a disease, perceived disease severity, cues to actions that prompt recommended screening practices, perceived barriers to taking recommended health actions and perceived benefits of recommended health actions. The concept of self-efficacy, or the confidence in one's ability to take action and successfully achieve the preventive health behavior, was later added to the original HBM (Anagnostopoulos, Dimitrakaki, Niakas, & Tountas, 2013).

Several researchers have used standardized measures of HBM constructs, such as Champion's perceived benefits and barriers scales for screening mammography to determine relationships between health beliefs and health behaviors (Anagnostopoulos et al., 2013). Champion (1999) reports that interventions based upon the HBM constructs of perceived susceptibility, benefits, and barriers have been shown to significantly increase breast cancer screening behavior. Dr. Victoria Champion revised the Health Belief Model Scale for mammography utilization, with confirmed reliability and validity (Champion, 1999).

The purpose of this project is to investigate factors influencing mammography screening behaviors among women in two rural counties in Southern Ohio. The first objective for the project includes determining rural women's perceived susceptibility to breast cancer. The second objective involves identification of rural women's perception of barriers and benefits to screening mammography. After exploring the objectives, a secondary purpose is to communicate findings and make recommendations to local community stakeholders.

A non-experimental research design was employed for the project, in the form of a cross-sectional survey. Data was collected using a paper questionnaire survey with closed-ended responses in the form of Likert items and several open-ended questions. The Mammogram Survey (Appendix A) measured at an average of sixth grade readability level when tested on eight readability formulas (Readability Formulas, 2015). The survey was piloted at a community college with several nursing faculty members, to ensure the questions were understandable and easy to follow, as recommended by Terry (2012). No major issues were reported by the participants after the pilot administration of the survey. The DNP candidate served as the project leader and a master's prepared Registered Nurse (RN) helped as the research assistant. Purposive sampling was utilized to locate women who fit the inclusion criteria. The age range for the inclusion criteria was determined after consideration of the current body of available recommendations. The U. S. Preventive Services Task Force (2016) recommends biennial screening mammography for women 50-74 years. The American Congress of Obstetricians and Gynecologists (ACOG, 2015) recommends screening mammography to begin at age 40 and annually thereafter and at the beginning of this project, The American Cancer Society (ACS) was in agreement. In October of 2015, the ACS published revised screening recommendations,

advocating that women with an average risk of breast cancer should begin annual screening mammograms at age 45, transitioning to biennial screenings at age 55 (ACS, 2015). Given the variance in age recommendations, the target population for the project was women 40-75 years of age, the generally accepted range for screening mammogram consideration. English speaking women of all ethnic groups, races, education and socioeconomic levels who reside in Adams and Highland Counties in Ohio were asked to be participants. Women were recruited and asked to participate in the study at various public places throughout the two counties including: two campuses of a community college (a health fair on one campus), a church function, two Amish markets, a beauty salon, high school sporting events, Senior Citizens Centers, a factory, a farm supply store, a dental office, local hospital employees and three branches of the Adams County public libraries. Exclusion criteria includes men, women under 40 and over 75 years of age, and women with a history of breast cancer. There are approximately 7,087 women in Adams County and 10,877 women in Highland County over the age of 40 years (United States Census Bureau, 2015). Due to the descriptive nature of this scholarly project and convenience method of recruitment, a minimum sample size of 50 women was sought and 100 surveys were completed. Ninety of the participants met the inclusion criteria.

Prior to answering the questionnaire, the participants voluntarily signed and dated a consent form that was not attached to the survey. After turning in the survey, educational materials about breast health were available, as well as an ink pen from Susan G. Komen. The participant was also given a list of local phone numbers and contact information for regional health care professionals available to assist in obtaining a screening mammogram or other breast health information. All surveys were anonymous, coded only with numbers, thus privacy of the participants remains protected.

Every year, October is recognized as breast cancer awareness month, which was an opportune time to implement the project. Once the project was approved by the Institutional Review Board (IRB) of Otterbein University (Appendix C), the DNP candidate began execution of the project. At the beginning of September, the recruitment inducements (pink pens) and educational materials, were donated by the Susan G. Komen Greater Cincinnati Affiliate. In late September, the RN research assistant was fully oriented to the model and survey. In October, written permission was obtained by Dr. Victoria Champion at Indiana University to utilize her

revised tool, the Champion Health Belief Model Scale (CHBMS) for mammography (Appendix B). The majority of travel around the two counties for data collection occurred during October, 2015.

The budget for this scholarly project had numerous considerations. The DNP candidate carefully took all foreseeable expenses into account, including salaries/wages, start-up costs, capital costs (none), and operational costs (Moran, Burson, & Conrad, 2014). A \$400 grant from the Otterbein University Student Research Fund was awarded for the project. Actual expenses for the project were \$341.35, which was \$36.88 over the original budget, as demonstrated in Table 1.

Table 1 - Project Budget

"Factors Influencing Participation in Screening Mammography Among Rural Women" DNP Scholarly Project by Kelly Colliver									
Expenses	Calculation	SRF Request	Additional Funding	Estimated Total	Actual Expense				
<b>Wages:</b>									
Research Assist	\$30*4 hours	\$120	0	\$120	\$90				
Admin Assist	\$20*2 hours	\$40	0	\$40	\$70				
<b>Printing:</b>									
100 copies single page b/w	\$.09*100	\$9	0	\$9	\$12				
100 copies triple page/stapled	\$.29*100	\$29	0	\$29	\$42				
<b>Envelopes:</b>									
100 Business	\$8.29*1 box	\$8.29	0	\$8.29	\$9.99				
100 Brown clasp	\$14.99*1 box	\$14.99	0	\$14.99	\$9.99				
Poster	\$12.99*1 Ea.	\$12.99	0	\$12.99	\$3.88				
Inducements	\$2*100 Ea.	\$0.00	\$200	[Donation] \$200	\$0				
Educational Material	\$14*1 Ea.	\$0.00	\$14	[Donation] \$14	\$0				
					\$6.29				
									Package of 3 clipboards, not in original budget
<b>Mileage: (from Hillsboro, Oh)</b>									
To Mt Orab, Oh	0.45*50 miles	\$22.50	0	\$22.50	\$22.50				
To West Union, Oh	0.45*60 miles	\$27	0	\$27	\$54				Made 2 trips to West Union
To Peebles, Oh	0.45*46 miles	\$20.70	0	\$20.70	\$21				
Total		\$304.47	\$214	\$518.47	\$341.35				
Budget Variance (unfavorable) favorable					(\$36.88)				

The data collection was carried out as planned, although some barriers were identified. Perhaps the most significant barrier was the lengthy nature of the survey and open ended questions. Some potential participants looked over the three pages and opted not to participate. Since the survey could not be altered at that time, encouragement was given to the participants that the time frame would not be too extensive. Lack of interest, cultural barriers, and knowledge deficit were some of the other obstacles faced.

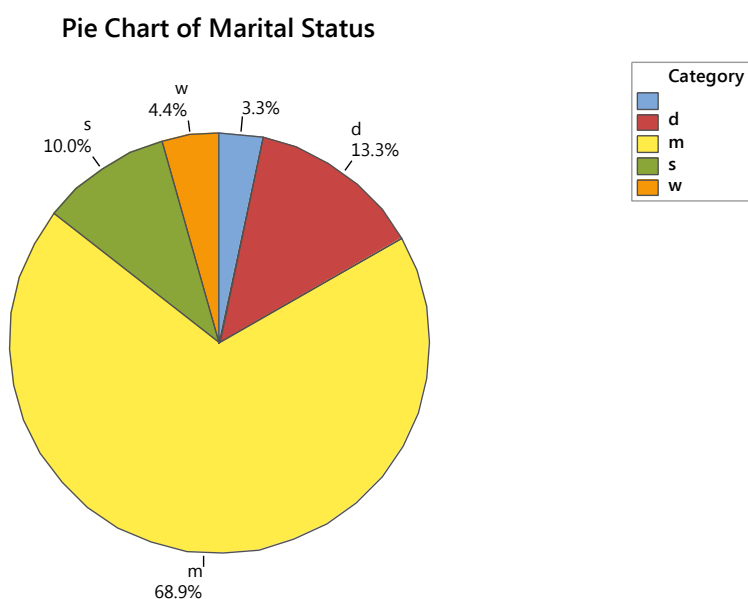
### Analysis and Outcome Evaluation

In this project, 100 mammogram surveys were completed by rural women who



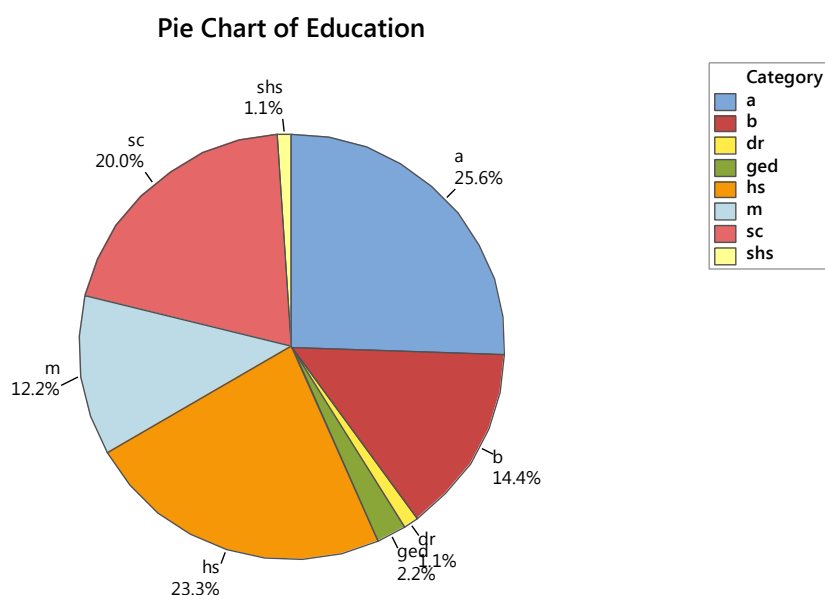
volunteered to participate. Ninety of the participants met the inclusion criteria, ranging from 40-75 years of age. Quantitative data analysis was performed using Minitab software. Descriptive and inferential statistics were utilized to analyze the data. Descriptive statistics provide summaries about the sample and describe the data, inferential statistics allow conclusions to be drawn about the data (Terry, 2012). The following descriptive statistics provide facts regarding the rural women that participated in the project. The average participant age was 54.8 years. Caucasian was the race of 96.7% of women, with 2.2% marking “other” for race. The majority of women (75.6%) resided in Highland County, while 12.2 % lived in Adams County. Although these two counties were the focus of the project, women who volunteered from surrounding rural counties were permitted to take part in the survey, comprising 12.1% of the participants. Status of health insurance was recorded as yes or no, without regard to public or private plans. For this group, 97.8% of women reported to have health insurance coverage at the time of the survey. The following pie charts, Figures 1 and 2, illustrate the marital status and education levels of the participating rural women.

Figure 1 – Pie Chart of Marital Status



Key: d=divorced, m=married, s=single, w=widowed

Figure 2 – Pie Chart of Education



Key: a= Associate's degree, b= Bachelor's degree, dr= Doctorate degree, ged= General Education Diploma, hs= high school graduate, m= Master's degree, sc= some college, shs= some high school

The Health Belief Model Scale for mammograms, by Dr. Victoria Champion, was utilized with permission, as part of the survey. The first section contains three statements pertaining to susceptibility to breast cancer, displayed as Health Belief 1-3 on the table below. The second section contains five statements regarding benefits of mammograms, displayed as Health Belief 4-8. Lastly, Health Belief 9-18 are ten statements concerning perceived barriers to mammography. The participants ranked each statement in the Health Belief Model Scale on a Likert scale scoring system: 1 = strongly agree, 2 = agree, 3 = neutral, 4= disagree and 5= strongly disagree. Table 2 summarizes the responses from the participants in terms of percentages.

Table 2 – Percentage of Women Choosing Each Statement

**Champions Health Belief Model Scale**

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>Susceptibility</b>					
1. It is likely that I will get breast cancer.	3.3%	12.2%	46.7%	21.1%	13.3%
2. My chances of getting breast cancer in the next few years are great.	2.2%	12.2%	38.9%	24.4%	18.9%
3. I feel I will get breast cancer sometime during my life.	2.2%	11.1%	36.7%	31.1%	13.3%
<b>Benefits</b>					
1. If I get a mammogram and nothing is found, I do not worry as much about breast cancer.	11.1%	41.1%	22.2%	21.1%	3.3%
2. Having a mammogram will help me find breast lumps early.	30.0%	51.1%	7.8%	5.6%	2.2%
3. If I find a lump through a mammogram, my treatment for breast cancer may not be as bad.	11.1%	40.0%	22.2%	20.0%	5.6%
4. Having a mammogram is the best way for me to find a very small lump.	28.9%	37.8%	15.6%	11.1%	4.4%
5. Having a mammogram will decrease my chances of dying from breast cancer.	24.4%	43.3%	22.2%	5.6%	3.3%
<b>Barriers</b>					
1. I am afraid to have a mammogram because I might find out something is wrong.	2.27%	4.55%	6.82%	39.77%	46.59%
2. I am afraid to have a mammogram because I don't understand what will be done.	0	2.27%	3.41%	37.50%	56.82%
3. I don't know how to go about getting a mammogram.	0	2.27%	2.27%	31.82%	63.64%
4. Having a mammogram is too embarrassing.	0	4.55%	6.82%	32.95%	55.68%
5. Having a mammogram is too painful.	0	6.82%	13.64%	34.09%	45.45%
6. People doing mammograms are rude to women.	2.3%	0	6.9%	24.14%	66.67%
7. Having a mammogram exposes me to unnecessary radiation.	2.3%	1.15%	14.94%	44.83%	36.78%
8. I cannot remember to schedule a mammogram.	1.15%	10.34%	17.24%	22.99%	48.28%
9. I have other problems more important than getting a mammogram	0	3.41%	9.09%	45.45%	42.05%
10. I am too old to need a routine mammogram.	0	0	4.55%	35.23%	60.23%

There were several questions at the end of the survey regarding potential barriers to participation in screening mammography. The majority of women, 77.8%, reported that they were not concerned about paying for a mammogram. Slightly over half of the women did not know how to get a low cost or free mammogram in their county. Regarding transportation, only 4.4% of women report experiencing difficulties getting to the mammogram facility.

Several inferential statistical tests were also performed on the data. A two proportions test found with statistical significance ( $p < 0.001$ ), that women who have a primary care provider are more likely to participate in screening mammography (61.0%) than women without a primary care provider (16.7%). A second two proportions test was performed to analyze a woman's perceived susceptibility to breast cancer and its influence on participation in regular screening mammograms. There is insufficient evidence at the 95% confidence level to reject the null hypothesis that the two proportions are identical. Thus, whether or not the woman perceived herself as susceptible to breast cancer, the screening rates did not differ significantly. Interestingly, 73.6% of women who viewed themselves as "not susceptible" obtained regular screening mammograms. Whereas, 85.7% of women who viewed themselves as "susceptible" participated in regular screening mammograms. The slight increase of participation in screening mammograms was not statistically significant. Data analysis was also utilized to examine the relationship between family history of breast cancer and a woman's perceived susceptibility to breast cancer. A two sample T-test found with statistical significance ( $p = 0.029$ ), at the 95% confidence interval, that a positive family history of breast cancer does increase perception of susceptibility to breast cancer among rural women.

This data contributes to the evaluation of the first objective of the project, determining rural women's perceived susceptibility to breast cancer. Examination of the susceptibility statements from Champions Health Belief Model Scale facilitated a deeper understanding and evaluation of this objective. After analysis of the data from the three susceptibility statements, it was determined that 14% of rural women agreed that they were susceptible to breast cancer. Approximately 41% of women disagreed with the susceptibility statements, feeling that they are

not susceptible to breast cancer now, or in their lifetime. Similarly, 41% of the women remained neutral and did not agree or disagree with the susceptibility statements. The inferential statistics provided further insight regarding rural women's perceptions. Remarkably, whether or not a woman viewed herself as susceptible to breast cancer, the participation rates in screening mammography did not differ significantly. A positive family history of breast cancer was found to increase a rural woman's perceived susceptibility to breast cancer. Thus, most rural women, unless there is a positive family history of breast cancer, do not view themselves susceptible to breast cancer. Although, for the health care provider, it is important to realize this does not necessarily mean they will not participate in regular screenings.

The mammogram survey contained four open-ended questions, rendering data suitable for qualitative exploration. The responses were organized and categorized for sets of patterns and themes, as suggested by Terry, 2012. NVivo software was utilized for qualitative analysis of the data. When considering the many possible issues rural women face concerning screening mammography, certain themes became evident during data analysis. Time and related concepts were cited most frequently by the rural women as barriers to participation in screening mammography. Many women said their busy schedule, not making time for themselves and long work hours contributed to not having regular mammograms. Other less common themes included fear, pain, and not having a primary care provider, consistent with the findings in the literature. Regarding factors that facilitated participation in regular screening mammograms, the most prevalent responses included getting a reminder card and easy local access. Similar patterns concerning access included improved insurance coverage for no cost screenings, mobile vans, and flexible hours at the screening facilities were also identified. In summary, the responses to the open-ended questions gave a deeper understanding of the perceptions and attitudes of rural women toward participation in screening mammography. The word cloud generated by NVivo, shown in Figure 3, illustrates the frequency of verbiage from the participants regarding perceived facilitators and barriers to participating in screening mammography.



## **Conclusion and Recommendations**

In conclusion, this project found that rural women in the area are able to realize the benefits of screening mammography. Rural women do not view themselves as particularly susceptible to breast cancer, unless there is a positive family history of breast cancer. Regardless of perceived susceptibility to breast cancer among rural women, the rates of participation in screening mammography are the same.

Based on the findings of this project, several recommendations can be made. Consistent with the findings in the literature that were discussed earlier, provider involvement and referral is key in facilitating timely participation in screening mammography for rural women. Thus, it is recommended that APRNs realize the importance of their role in health promotion activities. Given recent changes and variation in screening recommendations among agencies, women are voicing more confusion than ever. Hence, the importance of a trusting relationship with a primary care provider is becoming increasingly significant. The APRN needs to serve as a reliable resource, assessing risk factors with the woman, providing up to date information and individualized recommendations for screening. Thus, whether working in a rural or urban setting, the APRN will have the same important role of becoming a champion for health promotion. Formulating a personalized approach to health promotion and maintenance for each patient is key for a trusting relationship that results in positive health outcomes, irrespective of the setting. Future nursing research should focus on the APRN's role in health promotion behaviors. Another possible project includes investigating barriers to attaining primary care providers among rural residents. Any research that will help improve health promotion and ultimately enhance health outcomes among disadvantaged rural populations is needed. Detailed recommendations for the community stakeholders involved in the project area can be found in Appendix D.

## **Summary**

In summary, valuable information was gained about rural women in Southern Ohio regarding factors influencing participation in screening mammography. Most of the findings were consistent with the available literature, confirming common beliefs and barriers. The role of APRN cannot be underestimated when it concerns moving women toward health promotion and screening behaviors.

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**Appendix A**

Hello,

Thank you for your interest in this survey. Participation is voluntary and all information will be kept anonymous and confidential. The survey should take 15 minutes or less to complete.

My name is Kelly Colliver, I am a Family Nurse Practitioner and a Doctor of Nursing Practice candidate at Otterbein University in Columbus, Ohio. My project is looking at factors that influence rural women to get screening mammograms. Early detection of breast cancer saves lives, therefore getting a screening mammogram on time is very important to your health.

Attached is a short survey asking about your feelings about breast cancer and mammograms. There are no wrong answers, so please answer honestly and openly. All of your responses are kept confidential and you do not have to put your name on the survey. You may withdraw from the survey at any time without penalty. Also, you may choose to skip any questions that you do not want to answer. When you are finished answering the questions, fold and place in the box labeled “surveys”. Please take a pen and some breast health information as a small “thank you” from me.

I truly appreciate your time and assistance in helping me to complete this project. If you need information about how you can get a screening mammogram, there is a list of local providers and telephone numbers included in the educational materials. If you have questions or would like more information, you can contact your health care provider, a local hospital or me at [kelly.colliver@otterbein.edu](mailto:kelly.colliver@otterbein.edu).

Your participation is voluntary. Please sign on the consent line below, then place all the papers in the box when finished with the survey.

Thank you,

Kelly Colliver MSN, FNP-BC

I voluntarily consent to participate in this survey:

Participant Signature \_\_\_\_\_ Date \_\_\_\_\_

Mammogram SurveyDemographic Questions: (Circle or fill in the blank)

Age: \_\_\_\_\_

Race/Ethnicity: African-American Asian Caucasian Hispanic Other

Marital status: Single Married Widowed Divorced Separated

Highest level of education: Some high school HS graduate GED Some college

Associates Bachelors Masters Doctorate

What county do you live in? Adams Highland Other \_\_\_\_\_

Do you have health insurance? Yes No

Medical background

Do you have a family doctor or primary care provider that you see regularly? Yes No

Have you received advice from your doctor or primary care provider saying when you should get regular mammograms? Yes No

Do you usually get a mammogram every one or two years? Yes No

Date of last mammogram?

Within the: last 12 mo 12-24 mo 24-36 mo over 3 years never had mammogram

Have you ever had an abnormal mammogram? Yes No

Have you ever had breast cancer? Yes No

Has anyone in your family had breast cancer? Yes No

**Champion's Health Belief Model Scale**

Circle your answer on the scale for each statement

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>Susceptibility</b>					
1. It is likely that I will get breast cancer.	1	2	3	4	5
2. My chances of getting breast cancer in the next few years are great.	1	2	3	4	5
3. I feel I will get breast cancer sometime during my life.	1	2	3	4	5
<b>Benefits</b>					
1. If I get a mammogram and nothing is found, I do not worry as much about breast cancer.	1	2	3	4	5
2. Having a mammogram will help me find breast lumps early.	1	2	3	4	5
3. If I find a lump through a mammogram, my treatment for breast cancer may not be as bad.	1	2	3	4	5
4. Having a mammogram is the best way for me to find a very small lump.	1	2	3	4	5
5. Having a mammogram will decrease my chances of dying from breast cancer.	1	2	3	4	5
<b>Barriers</b>					
1. I am afraid to have a mammogram because I might find out something is wrong.	1	2	3	4	5
2. I am afraid to have a mammogram because I don't understand what will be done.	1	2	3	4	5
3. I don't know how to go about getting a mammogram.	1	2	3	4	5
4. Having a mammogram is too embarrassing.	1	2	3	4	5
5. Having a mammogram is too painful.	1	2	3	4	5
6. People doing mammograms are rude to women.	1	2	3	4	5
7. Having a mammogram exposes me to unnecessary radiation.	1	2	3	4	5
8. I cannot remember to schedule a mammogram.	1	2	3	4	5
9. I have other problems more important than getting a mammogram	1	2	3	4	5
10. I am too old to need a routine mammogram.	1	2	3	4	5

Barriers to mammography:

What are the things that make it easy for you to get a mammogram every year or two?

What are the things that make it hard for you to get a mammogram every year or two?

If you have not had a mammogram in the last 12 months, what is the main reason?

Do you ever have concerns that you will not be able to pay for a mammogram? Yes No

Do you know how to get a low cost or free mammogram in your county? Yes No

Do you ever have transportation difficulties getting to the mammogram? Yes No

Is there anything else you would like to say about reasons why you would or would not get a mammogram?

**Appendix B**



October 13, 2015

Kelly Colliver, MSN, FNP-BC  
Associate Professor of Nursing  
Southern State Community College  
Columbus, OH

Dear Professor Colliver,

Thank you for your interest in my work. You have permission to view, modify, and use the Health Belief Model for your use as long as you cite my work and send me an abstract of your completed project.

Sincerely,

A handwritten signature in black ink that reads "Victoria Champion".

Victoria Champion, Ph.D., R.N., F.A.A.N.  
Distinguished Professor  
Edward W. and Sarah Stam Cullipher Endowed Chair  
Associate Director Cancer Prevention and Control/Population Sciences  
Indiana University Simon Cancer Center

VC:dg



Appendix C

INSTITUTIONAL REVIEW BOARD  
RESEARCH INVOLVING HUMAN SUBJECTS  
OTTERBEIN UNIVERSITY

☒ Original Review  
☐ Continuing Review  
☐ Five-Year Review  
☐ Amendment

ACTION OF THE INSTITUTIONAL REVIEW BOARD

With regard to the employment of human subjects in the proposed research:

HS # 15/16-11

Keane & Colliver: Factors influencing participation in screening mammography ...

THE INSTITUTIONAL REVIEW BOARD HAS TAKEN THE FOLLOWING ACTION:

☐ Approved ☐ Disapproved  
☒ Approved with Stipulations\* ☐ Waiver of Written Consent Granted  
☐ Deferred

\*Stipulations stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least four (4) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the college, signed consent forms are to be transferred to the Institutional Review Board for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: 29 August 2015

Signed: \_\_\_\_\_

Chairperson

OC HS Form AF

This is approved. And the stipulation of the slightly revised consent form is in the emails of Aug 23-24, 2015.

## **Appendix D**

### **Recommendations**

Based on the findings of this scholarly project, several concepts and interventions aimed at facilitating participation in screening mammography among rural women will be recommended.

Three key messages to community stakeholders may help to improve health outcomes for rural women of the area.

1. A primary care provider (PCP) is essential for positive health outcomes for rural women.
  - a. Since women with a PCP are more likely to get routine mammograms, this relationship should be promoted.
  - b. Advertise that PCPs in the area are taking new patients – target women. The PCP can help women to make sense of all the screening recommendations and decide on an individualized plan for each woman.
  - c. PCPs should send women reminder letters, make reminder phone calls or even help them schedule an appointment, which will enable timely screenings.
  - d. Professional development and up-to-date education should be offered to health care providers in the area.
2. Access is key for rural women.
  - a. Remind women (ie: through public media, education campaigns) that all insurance plans must cover no cost screening mammograms, due to the Affordable Care Act.
  - b. Advertise screening programs that are available for women who do not have insurance (ie: Ohio's Breast and Cervical Cancer Project).
  - c. Encourage imaging centers to have extended hours of operation, offering evening and/or weekend appointments.
  - d. Partner with mobile vans to service the hard to reach, at risk populations in the county.
  - e. Work with local employers to incorporate screenings into work site health or wellness programs.
3. Health screenings are important for rural women.
  - a. Promote self-care among women in the area.
  - b. Offer educational information highlighting the importance of health promotion and screenings.
  - c. Offer incentives, partnering with local businesses, as a bonus for the women when they attend a screening (ie: discount coupons to local spa, hair salon, home store).
  - d. Offer mammograms during other events such as health fairs or group education offerings.
  - e. Collaborate with local stakeholders (American Cancer Society, Susan G. Komen, etc.) on conducting a mammogram screening or women's health event.

**Appendix D**

References and Resources for Community:

The American Cancer Society [www.cancer.org](http://www.cancer.org)

The Centers for Disease Control and Prevention

<http://www.cdc.gov/cancer/nbccedp/pdf/breastcanceractionguide.pdf>

The Community Guide

<http://www.thecommunityguide.org/cancer/screening/client-oriented/index.html>

<http://www.thecommunityguide.org/about/What-Works-Cancer-Screening-factsheet-and-insert.pdf>

The National Cancer Institute [www.cancer.gov/publications](http://www.cancer.gov/publications)

Research-Tested Interventions <http://rtips.cancer.gov/rtips>